NGA Center for BEST PRACTICES

Issue Brief

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Achieving Statewide Public Safety Wireless Interoperability[i]

Summary
Popular television shows that feature computers in patrol cars, life-saving technologies in rescue vehicles, and the latest state-of-the-art dispatch centers, may lead citizens to believe that first responders can and do effortlessly communicate with each other on a regular basis. But the truth is many public safety radio communication systems across this country lack interoperability, or the ability to share voice and data, between and among agencies and jurisdictions.

Interoperability is a serious, and pressing, public safety problem that severely undermines the capacities of law enforcement, firefighters, and other first responders to respond to, and manage, emergency situations. The tragic events of Sept. 11, 2001, have focused attention on the urgent need to take steps to ensure that public safety and other agencies whose assistance may be required in a crisis can communicate reliably and effectively when called upon.

To achieve interoperability, public officials must address five key challenges:

1. Incompatible and aging communications equipment
2. Limited and fragmented funding
3. Limited and fragmented planning
4. Lack of coordination and cooperation
5. Limited and fragmented radio spectrum

Governors can play a pivotal role in meeting these challenges by providing the leadership that can create statewide and regional interoperability capacity for more effective public safety. In doing so, Governors can employ the following strategies:

- Institutionalize a governance structure that fosters collaborative planning among local, state, and federal government agencies
- Encourage the development of flexible and open architecture and standards
- Support funding for public safety agencies that work to achieve interoperability and reject agency budgets that do not include interoperable solutions
- Support the public safety community in working with the Federal Communications Commission (FCC) to allocate ample spectrum for public safety and create contiguous bands for public safety spectrum.

The purpose of this Issue Brief is to provide a definition of interoperability, a discussion of the challenges facing interoperable communications, and strategies that Governors can use to achieve interoperability in their state.

What is Interoperability?
Interoperability is the ability of public safety agencies, including law enforcement, firefighters, and emergency medical services to talk to one another via radio communication systems exchanging voice and/or data with one another on demand, in real time, during an event. The current state of interoperability varies from state to state. According to a federal study of state emergency communications capabilities, only 14 states have implemented "shared, interoperable systems and have formalized sharing agreements with public safety agencies at multiple levels of government."[ii] The majority of states are in the development stages of interoperability; that is, "crafting strategic plans for system design, engineering, and implementation."[iii] However, most are still operating under a system of temporary, patchwork solutions that oftentimes do not accommodate all responders and that may require the cumbersome use of more than one radio during an incident.

Lessons from the Field

On Sept. 11th hundreds of firefighters did not receive the same warning to evacuate the World Trade Center that the police officers did. Why? Firefighters and police departments were using different radio systems that could not talk to each other. *("Why Can't We Talk," pp. 4.)*

At the same time a different picture emerged from the Pentagon. Federal, state, and local emergency responders in the Washington, DC area were able to communicate because they had a mutual-aid interoperability plan. This plan was developed in response to the 1982 Air Florida plane crash in Washington, DC. At that time agencies were not able to communicate and set about making changes. Regional planning produced successful procedures for mutual-aid interoperability on 9/11. *("Answering the Call: Communications Lessons Learned from the Pentagon Attack," Public Safety Wireless Network, February 1, 2003.)*

Challenges to Interoperability[iv]
There are five key issues underlying the current status of interoperability among public safety agencies in this country – incompatible and aging communications equipment, limited and fragmented funding, limited and fragmented planning, a lack of coordination and cooperation, and inadequate and fragmented radio spectrum. This section of the Issue Brief is largely paraphrased and quoted from an excellent publication, *"Why Can't We Talk? Working Together to Bridge the Communications Gap to Save Lives,"* produced by the National Task Force on Interoperability. The NGA Center for Best Practices, along with 17 other national associations, served on this task force to produce this guide for public officials on interoperability.

Incompatible and aging communications equipment
In many jurisdictions across the country, radio communication system infrastructure and equipment—towers, control and dispatch stations, handheld and mobile radios—are 20 to 40 years old. Antiquated systems and aging equipment have led to escalating maintenance costs, reduced reliability, and obsolescence for public safety agencies.

Public safety field personnel rely on their radios for assistance or back up in emergencies. Many radio systems in use today are obsolete or will become obsolete as manufacturer support is discontinued for older equipment. When systems deterioration results in an inability to exchange voice and data communications, field personnel are in danger and citizens are at risk, both in day-to-day and emergency operations.

Just as different computer operating systems will not work together or an AM receiver will not accept an FM signal, radio systems operating on different equipment and frequencies cannot communicate with one another. In addition, some newer digital radio systems that operate on unique proprietary software prevent the exchange of voice or data communications even on the same radio frequency.

Limited and fragmented funding
In most cases public safety agencies historically have developed systems based on individual needs when planning a radio communication system. Spending decisions are based on strategies that did not consider the need for interoperability.

Today, local, state, and federal government face budget shortfalls, and competition is stiff among public agencies for scarce resources. Moreover, efforts to secure funding for initiatives that cut across agencies and jurisdictions are undermined by the typical practice of financing government functions on an agency-by-agency, jurisdiction-by-jurisdiction basis. Short-term strategies to incrementally improve existing radio communication systems with limited resources need to be explored and developed.

Limited and fragmented planning
Interoperability planning is under-financed and fragmented. Yet, without adequate planning, resources are wasted and the outcome is inadequate. The lack of coordination among funding streams for updating or replacing radio communications equipment also works against overall interoperability. Differing agency and community funding priorities and budget cycles compound the problem. Without adequate planning, investments are made in systems and equipment that oftentimes are not interoperable, further cementing various agencies and communities. Agencies and jurisdictions also compete for limited federal funds, which works against the partnership required to develop interoperability.

Lack of coordination and cooperation
Although the need for a coordinating body is clear, the reality is that many public safety agencies are reluctant to give up management and control of their communications systems due to disparate agency missions and jurisdictional responsibilities. Interoperability requires a certain amount of shared management, control, policies, and procedures. While interoperability may appear to be a technical issue, it has more to do with establishing trust and buy-in among the stakeholders.

Limited and fragmented radio spectrum
The Federal Communications Commission (FCC) oversees spectrum management and has allocated certain frequencies to public safety. Spectrum refers to the amount of bandwidth available for all over-the-air communications—a finite resource. An extremely limited amount of radio spectrum is reserved for public safety and what does exist for this purpose is inadequate to accommodate the increasing number of electronic devices that require more and more spectrum to operate. In response, the FCC has assigned additional frequency bands to public safety, which now operates in 10 separate bands. These allocated frequencies are scattered across the spectrum, making "ad hoc" technical solutions more difficult for different agencies and jurisdictions. As technology has advanced and improved, transmission at higher frequencies has become possible.[v]

There are two major spectrum management issues on the high-end frequencies. The 700 MHz radio spectrum allocated for public safety is blocked by ongoing television broadcast operations. Current law permits television stations to remain on the air until December 31, 2006, or until 85 percent of households in the relevant market have access to digital television signals, whichever is later. The ability of public safety to use the 700 MHz radio spectrum is contingent upon how fast the public replaces its analog televisions with digital television.[vi]

While the 800 MHz band is being used by many state and local governments for interoperable radio communications systems, the band also faces growing interference problems from commercial radio operations. The FCC is considering proposals to address this problem to reconfigure the band. In addition to the interference problem, the designated public safety channels have already been assigned to users in most major metropolitan areas, leaving little or no room for new system development or expansion of existing systems.[vii]

Strategies to Achieving Interoperability: The Role of the Governor

Governors are in a position to provide leadership and vision for creating statewide public safety wireless communications interoperability. Governors can build support for the investment and coordination that will be needed at the federal, state, and local levels by becoming an advocate for interoperable solutions. This is an investment the public seems more willing to make after September 11th.

Strategies for Governors

Governors can use the following strategies and best practices to achieve statewide interoperability.

- Institutionalize a governance structure that fosters collaborative planning among local, state, and federal government agencies
- Encourage the development of flexible and open architecture and standards
- Support funding for public safety agencies that work to achieve interoperability and reject agency budgets that do not include interoperable solutions
- Support the public safety community in working with the Federal Communications Commission (FCC) to allocate ample spectrum for public safety and create contiguous bands for public safety spectrum.

Institutionalize a governance structure that fosters collaborative planning among local, state, and federal government agencies

The governance structure is instrumental to building out an interoperable communications system. Not only does the governance structure solidify relationships and bring various stakeholders to the table, this body provides a vehicle for exploring innovative technologies and potential funding sources to achieve a given jurisdiction's vision of interoperability.

Governors as Catalysts

Gov. Ruth Ann Minner of **Delaware** became aware of the lack of interoperability when she was the owner of a towing company. During emergency incidents, the towing company's radio system was called upon to deliver messages to first responders because there was no interoperable communications. This firsthand knowledge of the state's lack of shared communications provided Gov. Minner with an understanding of the issues and a strong desire to correct the problem in the State of Delaware. Now Delaware has an 800 MHz, digital, trunked radio system that provides statewide coverage for more than 9,000 state, local, and federal users. (*"Why Can't We Talk?"* Supplemental resources, pp. 17.)

After 9/11, Gov. Michael Leavitt of **Utah** was adamant about ensuring the public's safety at the 2002 Winter Olympics in Salt Lake City. To meet the public's high expectations, there needed to be a significant investment of resources in the Utah Communications Agency Network (UCAN), an 800 MHz public safety radio system. Due to the enormous efforts of the public safety community, the system supported 15,600 Federal, State, county, and municipal users during the Olympics processing 8.5 million calls in 17 days. If there was an incident, UCAN would be able to provide immediate coverage for first responders. ("*Why Can't We Talk?"* Supplemental resources, pp. 26.)

Including local representation on the governance body, and in interoperability planning is a critical. The state governance board that oversees the development of public safety wireless communications needs to include the local public safety agency requirements for emergency communications. Local officials should be brought into the planning and decision-making processes early.

States may wish to consider creating a statewide system that provides incentives for local agencies to adopt. For instance, if the local agencies use the statewide infrastructure, they do not have to build their own and the state may even purchase mobile radios for local police, fire, and EMS. The state agencies should understand that local officials are most familiar with their needs as first responders, and therefore, create a statewide plan that accommodates these needs and guarantees efficient use of resources.

In addition the governance body also has to determine the appropriate level of interoperability during an incident. It would not be feasible for every police officer, every firefighter, and every emergency medical personnel to have interoperable communications. There would simply be too many people talking on the system at the same time. What public safety officials at the state, local, and federal levels must do is put in place an incident management command system with clearly defined protocols that can then determine who needs to talk to whom.

South Dakota

In **South Dakota** the public safety communications system had evolved over time with little statewide planning. After an extensive survey of local and federal agency needs, the state built a system that allows them to use the state's communications infrastructure based on the most prevalent technology in the state. In 2002, the state completed a system that allows users from local, state, and federal levels of government to communicate with each other at any place, anytime. The 150 MHz digital trunked statewide radio communications system became operational in October 2002. To encourage local public safety agencies to use the statewide system, they were provided with compatible mobile radios and access to the communications infrastructure. In providing these incentives, the state has been able to bridge its vision of building a communications system that provides interoperability based on local need, and create an incentive for compatible local equipment purchases in the future.[viii]

CapWIN

The Capital Wireless Integrated Network (CapWIN) is a multi-state, multi-jurisdictional wireless public safety system. This partnership of communities and agencies serving Washington, DC, **Maryland**, and **Virginia**, is working together to develop an Integrated Mobile Wireless Public Safety and Transportation Network that will enable public safety and transportation officials from over 40 local, State, and Federal agencies to communicate with one another in real time. CapWIN will provide firefighters, law enforcement, transportation officials, and other authorized emergency personnel with wireless access to multiple government databases during critical incidents, giving first responders and other public safety officials pertinent information to make critical decisions.[ix]

The strength of CapWIN lies in its governance structure that is representative of all the stakeholders. The Project Steering Group was established to provide project oversight and comprises nine members from state, local, and federal agencies, including law enforcement, emergency medical services, transportation, and public works. The Steering Group has routine oversight responsibilities, but defers to the executive group on matters of policy. The Project Executive Group is a 32-member body representing state, local,

and federal agencies from fire, police, emergency management, medical services, transportation, and publicly elected officials. This group facilitates implementation of policy based on input from the Steering Group.

Other State Examples

Efforts to overcome difficulties in bringing together parties from different agencies and levels of government are reflected in several states' interoperability strategies:

- **Indiana** created the Integrated Public Safety Commission (IPSC) in 1999, the key factor in winning the support of the locals. The IPSC provides structure to the local-state relationship. The state constructs the backbone of the system, namely the towers, controllers, and connectivity, and the locals purchase their user equipment. There would be no user fees, a plan favorable to local agencies.[x]

- **Minnesota** passed legislation in 1995 to create the Metropolitan Radio Board (MRB), which included representatives from local government, counties, State law enforcement, and other public safety providers. This allowed state agencies and local governments to develop shared solutions instead of building separate systems.[xi]

- The Executive Committee for the **Utah** Communications Agency Network (UCAN), created in 1997 through legislation, comprises 10 local government and five state members, appointed by the Governor.[xii]

- The **New York State Police** has divided the state into 16 communication zones with local representation from each zone. This approach keeps the stakeholders engaged in the goal of achieving interoperability. In additional, all state agencies meet biweekly on homeland security with interoperability being one of the issues discussed.

Encourage the development of flexible and open architecture and standards

In response to the current lack of standards, the Association of Public-Safety Communications Officials International, an association of public safety agencies and private sector companies, is developing a digital standard for wireless communications users known as "Project 25." Although not all first responders are adopting "Project 25" due to investments they may have already made in purchasing equipment, it is a model that agencies can use when purchasing digital radios to achieve interoperable communications.[xiii]

Recent funding for interoperable communications available through the Department of Homeland Security (DHS) and the Department of Justice's Office of Community Oriented Policing Services (COPS) requires that when localities are procuring equipment, an open-based standards approach should be used. Specifically, all new or upgraded communications systems should be compatible with Project 25. States that are in the position to select the jurisdiction should be aware of this requirement. For example, **Indiana** requires localities to use these standards before allocating funds towards their public safety needs. In this case, Indiana chose a fire department that has been involved with the build-out of the statewide communications infrastructure and will use the funds to expand their ability to serve the local community.

Support funding for public safety agencies that work to achieve interoperability and reject agency budgets that do not include interoperable solutions
Optimizing the use of limited funding available is an important element of interoperability planning and implementation. It is important for states to develop strategies for governmental units to coordinate and share funding for common infrastructure and equipment. State and local governments should ensure that homeland security funding designated for interoperable communications is spent effectively and efficiently through the coordination of statewide and regional plans.

Several states are using financial incentives to encourage and leverage cooperation and participation in interoperability initiatives:

- **Minnesota** has passed legislation that encourages state and local governments to share infrastructure instead of upgrading systems separately. The Minnesota Department of Transportation financed half the cost, partly through general obligation bonds, and partly with monies from the State's trunk highway fund. The other half of the capital costs have come from the Metropolitan Radio Board, through revenue bonds issues on its behalf by the Metropolitan Council. The debt service is provided by 4 cents – a part of the 911 surtax – collected monthly on all wired and wireless telephone lines statewide.[xiv]

- **Indiana** offered its statewide Project Hoosier SAFE-T system to localities. Johnson County estimates that it saved over $2 million by using the statewide system instead of building its own. In addition the maintenance of the statewide system is financed through a $1.25 surcharge on Department of Motor Vehicle transactions adding up to approximately $15 million per year.

- The **North Carolina** State Highway Patrol has installed a mobile data network that includes approximately 270 Federal, state, and local agencies sharing the mobile data network with over 7,100 users. By using towers owned by other agencies, North Carolina has been able to complete the network infrastructure, originally estimated at $100 million, for approximately $15 million.[xv]

- In the post-9/11 environment, **New Jersey** is installing an 800 MHz radio communications system in each of the state's 85 acute care hospitals. The goal is to piggyback on the New Jersey State Police radio network to leverage scarce resources for purchasing equipment and maintaining the system.[xvi]

- The **Utah** Communications Agency Network shares resources in the most cost-effective way by linking existing communications systems. Systems include the University of Utah network, intelligent transportation systems, and other state and local networks. The cost of radio service begins to decrease because of the economies of scale realized through creating a "network of networks."

Support the public safety community in working with the Federal Communications Commission (FCC) to allocate ample spectrum for public safety and create contiguous bands for public safety spectrum.
State and local governments are working with the FCC to find ways that will bring public safety frequencies into contiguous bands. Governors have adopted a policy through NGA that urges Congress to revise provisions of the Balanced Budget Act of 1997 to ensure that radio spectrum for public safety is available to state and local governments as soon as possible.[xvii]

Most recently, two Congressional lawmakers, Reps. Jane Harman (D-Calif.) and Curt Weldon (R-Pa.), have reintroduced a bill that would ensure that TV broadcasters transfer a 24 MHz piece of spectrum to public safety officials by 2006. The Homeland Emergency Operations (HERO) Act firmly sets a Dec. 31, 2006, deadline for the transition, closing the loophole that would allow broadcasters to continue to use the channels if digital TV was not received by a certain percentage of American households. According to lawmakers and public safety officials, only 1 percent of households have digital TV. Under the current legislation, TV broadcasters have until Dec. 31, 2006, to move or until 85 percent of the households in a market have access to digital TV signals, whichever is later.[xviii]

In addition, Nextel Communications is working with the FCC to create a plan whereby the 700 MHz band will be reconfigured to allow public safety channels to be contiguous. This is a long-term plan that has been submitted to the FCC for public comment, but has not been resolved.

Conclusion

Governors are well-positioned to provide the leadership that will facilitate a process for improving statewide and regional public safety communications interoperability. Without a statewide plan that incorporates an intergovernmental approach with specific action and support, new investments in equipment and infrastructure can serve to exacerbate the lack of interoperability.

While events like September 11th are unconscionable, they have brought attention to a serious public safety problem and provided an opportunity to bring stakeholders together to focus on the need for different and more effective emergency responses. The tools are available to achieve interoperability, but it will take leadership and political will to provide a greater impetus to work through jurisdictional battles and facilitate innovative policy and technical solutions.

Additional Resources

Federal Funding Sources

- Local Law Enforcement Block Grants (LLEBGs) from the Bureau of Justice Assistance (BJA) can be used to procure equipment, technology, and other material directly related to basic law enforcement functions.
- The Office for Domestic Preparedness (ODP) Equipment Grant Program can be utilized to enhance the capacity of state jurisdictions to respond to, and mitigate the consequences of, incidents of domestic terrorism involving the use of weapons of mass destruction (WMD). Communications equipment is part of the authorized equipment purchase list for these grants.
- The Web site for the Office of Justice Programs (OJP) Information Technology Initiatives offers guidance on both federal and private funding sources.
- The Advanced Generation Interoperability Law Enforcement program from the National Institute of Justice (NIJ).

Funding Opportunities

The Homeland Security Act of 2003 appropriates $3.5 billion for first responders, which includes funding for interoperable communications equipment. This funding is spread across several existing programs:

- Within the $900 million for the Justice Department's Law Enforcement Block Grant and the Byrne Grant programs, police departments are able to use this funding to buy communications equipment and other law enforcement technologies.

- The spending bill also includes $750 million for existing fire department grant programs that are run by the Federal Emergency Management Agency of which $25 million can be used for interoperable communications equipment.

- The Justice Department would receive $2.4 billion for first responder programs of which the Community Oriented Police Services (COPS) program would receive $20 million for interoperable radio equipment.[xix]

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[i] *"Why Can't We Talk? Working Together to Bridge the Communications Gap to Save Lives,"* National Task Force on Interoperability, February 2003, Executive Summary. http://www.agileprogram.org/ntfi. The National Governors Association served on the Task Force throughout 2002 and was involved in the preparation of this planning guide for public officials. Much of the text, ideas, and examples for this paper are drawn from the planning guide.
[ii] *The State of Interoperability*, Public Safety WINS (Wireless Interoperability National Strategy), http://www.publicsafetywins.gov/, April 14, 2003.
[iii] Ibid.
[iv] "Why Can't We Talk?," pp. 15-21.

[v] "Why Can't We Talk?", pp. 21.
[vi] Ibid., p. 53.
[vii] Ibid., p. 54.
[viii] "Why Can't We Talk?" Supplemental resources, pp. 5-11.
[ix] "Answering the Call: Communications Lessons Learned from the Pentagon Attack," Public Safety Wireless Network, February 1, 2003.
[x] "Why Can't We Talk?" Supplemental resources, pp. 14.
[xi] Ibid., pp. 17.
[xii] Ibid., pp. 25.
[xiii] APCO International and Project 25, http://www.apco911.org/ and http://www.project25.org/pages/archive.htm.
[xiv] "Why Can't We Talk?" pp. 18-19.
[xv] "Why Can't We Talk?" Supplemental resources, pp. 23.
[xvi] "New Jersey Enhances Disaster Preparedness," Government Technology, August 2002, www.govtech.net/news/news.phtml?docid=2002.08.28-30300000000020202.
[xvii] NGA Policy Position EDC-8.3, adopted July 2002.
[xviii] Sarkar, Dibya. "Bill would close spectrum loophole," March 26, 2003. http://www.fcw.com/geb/articles/2003/0324/web-spectrum-03-26-03.asp
[xix] Clarke, David, "Surprises May Lurk for Local Officials Anticipating Windfall for Emergency Units," CQ HOMELAND SECURITY, Feb. 13, 2003.